

METHOD OF CONTROLLING ZINC-DOPING IN A
COPPER-ZINC ALLOY THIN FILM ELECTROPLATED ON A
COPPER SURFACE AND A SEMICONDUCTOR DEVICE THEREBY FORMED

ABSTRACT OF THE DISCLOSURE

A method of fabricating a semiconductor device, having a reduced-oxygen Cu-Zn alloy thin film (30) electroplated on a Cu surface (20) by electroplating, using an electroplating apparatus, the Cu surface (20) in a unique chemical solution containing salts of zinc (Zn) and copper (Cu), their complexing agents, a pH adjuster, and surfactants; and annealing the electroplated Cu-Zn alloy thin film (30); and a semiconductor device thereby formed. The method controls the parameters of pH, temperature, and time in order to form a uniform reduced-oxygen Cu-Zn alloy thin film (30), having a controlled Zn content, for reducing electromigration on the Cu-Zn/Cu structure by decreasing the drift velocity therein which decreases the Cu migration rate in addition to decreasing the void formation rate, for improving device reliability, and for increasing corrosion resistance.